SEQUENCE LISTING

<110> Chen, Yih-Tai
Cao, Longguang

<120> A synthetic DNA encoding an orange seapen-derived green fluorescent protein with codon preference of mammalian expression systems and biosensors

<130> 41856-5

<160> 27

<170> PatentIn version 3.1

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accaagtatc ccgacgacat cgccgactac ttcgtgcaga gcttccctgc cggcttcttc 300

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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
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Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys Gly Asn Val Leu
20 25 30

Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys Gly Gly Pro Leu
35 40 45

Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg
50 55 60

Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser
65 70 75 80

Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly
85 90 95

Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe
100 105 110

His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro
115 120 125

Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser Phe Glu Val Val
130 135 140

Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp Leu Val Tyr Lys

145 150 155 160

Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met Lys Thr Phe Tyr Arg
165 170 175

Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr His Phe Ile His His
180 185 190

Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser Phe Val Glu Gln His
195 200 205

Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly
210 215

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Met Val Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser
1 5 10 15

Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met
20 25 30

Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln

35 40 45

Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val
50 55 60

Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp
65 70 75 80

Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr
85 90 95

Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser
100 105 110

Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg
115 120 125

Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu
130 135 140

Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu
145 150 155 160

Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr
165 170 175

Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu
180 185 190

Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val
195 200 205

Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu
210 215 220

Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

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Met Val Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala
1 5 10 15

Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu
20 25 30

Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile
35 40 45

Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser
50 55 60

Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp
65 70 75 80

Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu
85 90 95

Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp
100 105 110

Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly
115 120 125

Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly
130 135 140

Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val
145 150 155 160

Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser
165 170 175

Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe
180 185 190

Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu
195 200 205

Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr
210 215 220

Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

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<213> Ptilosarcus gurneyi

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Met Val Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys
1 5 10 15

Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly
20 25 30

Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg
35 40 45

Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile
50 55 60

Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile
65 70 75 80

Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg
85 90 95

Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile
100 105 110

Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn
115 120 125

Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met
130 135 140

Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly
145 150 155 160

Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys
165 170 175

His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro
180 185 190

Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu
195 200 205

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Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr
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Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225                 230                 235
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Met Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys Ala
1               5                   10                  15

Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe
            20                  25                  30

Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val
        35                  40                  45

Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala
    50                  55                  60

Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala
65                  70                  75                  80
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Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn
85 90 95

Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser
100 105 110

Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly
115 120 125

Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu
130 135 140

Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu
145 150 155 160

Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His
165 170 175

Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro Glu
180 185 190

Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly
195 200 205

Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile

210 215 220

Gly Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230 235

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<400> 9

Met Val Lys Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser
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Val Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe Gly
20 25 30

Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr
35 40 45

Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe
50 55 60

Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp
65 70 75 80

Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu

85 90 95

Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu
100 105 110

Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe
115 120 125

Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro
130 135 140

Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val
145 150 155 160

Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met
165 170 175

Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr
180 185 190

His Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser
195 200 205

Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly
210 215 220

Lys Pro Leu Gly Ser Leu His Glu Trp Val
225 230

<210> 10
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<213> Ptilosarcus gurneyi

<400> 10

Met Val Asn Thr Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser Val
1 5 10 15

Glu Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys
20 25 30

Gly Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys
35 40 45

Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln
50 55 60

Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr
65 70 75 80

Phe Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg
85 90 95

Phe Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu
100 105 110

Asp Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro
115 120 125

Ser Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser
130 135 140

Phe Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp
145 150 155 160

Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met Lys
165 170 175

Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr His
180 185 190

Phe Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser Phe
195 200 205

Val Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly Lys
210 215 220

Pro Leu Gly Ser Leu His Glu Trp Val
225 230

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Met Val Thr Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser Val Glu
1 5 10 15

Gly Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys Gly
20 25 30

Asn Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys Gly
35 40 45

Gly Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln Tyr
50 55 60

Gly Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr Phe
65 70 75 80

Val Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg Phe
85 90 95

Glu Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu Asp
100 105 110

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Asp Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro Ser
        115                 120                 125

Asn Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser Phe
    130                 135                 140

Glu Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp Leu
145                 150                 155                 160

Val Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met Lys Thr
                165                 170                 175

Phe Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr His Phe
            180                 185                 190

Ile His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser Phe Val
        195                 200                 205

Glu Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly Lys Pro
    210                 215                 220

Leu Gly Ser Leu His Glu Trp Val
225                 230


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Met Val Gly Leu Lys Glu Ile Met Ser Ala Lys Ala Ser Val Glu Gly
1               5                   10                  15

Ile Val Asn Asn His Val Phe Ser Met Glu Gly Phe Gly Lys Gly Asn
            20                  25                  30

Val Leu Phe Gly Asn Gln Leu Met Gln Ile Arg Val Thr Lys Gly Gly
        35                  40                  45

Pro Leu Pro Phe Ala Phe Asp Ile Val Ser Ile Ala Phe Gln Tyr Gly
    50                  55                  60

Asn Arg Thr Phe Thr Lys Tyr Pro Asp Asp Ile Ala Asp Tyr Phe Val
65                  70                  75                  80

Gln Ser Phe Pro Ala Gly Phe Phe Tyr Glu Arg Asn Leu Arg Phe Glu
                85                  90                  95

Asp Gly Ala Ile Val Asp Ile Arg Ser Asp Ile Ser Leu Glu Asp Asp
            100                 105                 110

Lys Phe His Tyr Lys Val Glu Tyr Arg Gly Asn Gly Phe Pro Ser Asn
        115                 120                 125
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Gly Pro Val Met Gln Lys Ala Ile Leu Gly Met Glu Pro Ser Phe Glu
    130                 135                 140

Val Val Tyr Met Asn Ser Gly Val Leu Val Gly Glu Val Asp Leu Val
145                 150                 155                 160

Tyr Lys Leu Glu Ser Gly Asn Tyr Tyr Ser Cys His Met Lys Thr Phe
                165                 170                 175

Tyr Arg Ser Lys Gly Gly Val Lys Glu Phe Pro Glu Tyr His Phe Ile
            180                 185                 190

His His Arg Leu Glu Lys Thr Tyr Val Glu Glu Gly Ser Phe Val Glu
        195                 200                 205

Gln His Glu Thr Ala Ile Ala Gln Leu Thr Thr Ile Gly Lys Pro Leu
    210                 215                 220

Gly Ser Leu His Glu Trp Val
225                 230
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<213> Ptilosarcus gurneyi

<400> 13

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile

130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

<210> 14
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<212> PRT
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<400> 14

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser

20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

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Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
                165                 170                 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
            180                 185                 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
        195                 200                 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
    210                 215                 220

Leu
225


<210>  15
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<213>  Ptilosarcus gurneyi

<400>  15

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1               5                   10                  15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
            20                  25                  30
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Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

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Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
            180                 185                 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
        195                 200                 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
    210                 215                 220

Leu Thr
225
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<400> 16

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Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1               5                   10                  15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
            20                  25                  30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
        35                  40                  45
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Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr
225

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<400> 17

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr

195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile
225

<210> 18
<211> 229
<212> PRT
<213> Ptilosarcus gurneyi

<400> 18

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro

65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

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Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
    210                 215                 220


Leu Thr Thr Ile Gly
225


<210>  19
<211>  230
<212>  PRT
<213>  Ptilosarcus gurneyi

<400>  19

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1               5                   10                  15


Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
            20                  25                  30


Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
        35                  40                  45


Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
    50                  55                  60


Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65                  70                  75                  80
```

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys
225 230

<210> 20
<211> 231
<212> PRT
<213> Ptilosarcus gurneyi

<400> 20

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro
225 230

<210> 21
<211> 232
<212> PRT
<213> Ptilosarcus gurneyi

<400> 21

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

```
Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
        115                 120                 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
    130                 135                 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145                 150                 155                 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
                165                 170                 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
            180                 185                 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
        195                 200                 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
    210                 215                 220

Leu Thr Thr Ile Gly Lys Pro Leu
225                 230

<210>  22
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<211> 233
<212> PRT
<213> Ptilosarcus gurneyi

<400> 22

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr

115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly
225 230

<210> 23
<211> 234
<212> PRT
<213> Ptilosarcus gurneyi

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<400> 23

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser
225 230

<210> 24
<211> 235
<212> PRT
<213> Ptilosarcus gurneyi

<400> 24

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Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1               5                  10                  15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
            20                  25                  30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
        35                  40                  45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
    50                  55                  60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65                  70                  75                  80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
                85                  90                  95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
            100                 105                 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
        115                 120                 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
    130                 135                 140
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Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145                 150                 155                 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
                165                 170                 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
            180                 185                 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
        195                 200                 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
    210                 215                 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu
225                 230                 235
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<210> 25
<211> 236
<212> PRT
<213> Ptilosarcus gurneyi

<400> 25

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Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1               5                   10                  15
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Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
            20                  25                  30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
        35                  40                  45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
    50                  55                  60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65                  70                  75                  80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
                85                  90                  95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
            100                 105                 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
        115                 120                 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
    130                 135                 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145                 150                 155                 160
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Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His
225 230 235

<210> 26
<211> 237
<212> PRT
<213> Ptilosarcus gurneyi

<400> 26

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

```
Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met
        35                  40                  45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
    50                  55                  60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65                  70                  75                  80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
                85                  90                  95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
            100                 105                 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
        115                 120                 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
    130                 135                 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145                 150                 155                 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
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165 170 175

Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
180 185 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
195 200 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
210 215 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu
225 230 235

<210> 27
<211> 238
<212> PRT
<213> Ptilosarcus gurneyi

<400> 27

Met Val Asn Arg Asn Val Leu Lys Asn Thr Gly Leu Lys Glu Ile Met
1 5 10 15

Ser Ala Lys Ala Ser Val Glu Gly Ile Val Asn Asn His Val Phe Ser
20 25 30

Met Glu Gly Phe Gly Lys Gly Asn Val Leu Phe Gly Asn Gln Leu Met

35 40 45

Gln Ile Arg Val Thr Lys Gly Gly Pro Leu Pro Phe Ala Phe Asp Ile
50 55 60

Val Ser Ile Ala Phe Gln Tyr Gly Asn Arg Thr Phe Thr Lys Tyr Pro
65 70 75 80

Asp Asp Ile Ala Asp Tyr Phe Val Gln Ser Phe Pro Ala Gly Phe Phe
85 90 95

Tyr Glu Arg Asn Leu Arg Phe Glu Asp Gly Ala Ile Val Asp Ile Arg
100 105 110

Ser Asp Ile Ser Leu Glu Asp Asp Lys Phe His Tyr Lys Val Glu Tyr
115 120 125

Arg Gly Asn Gly Phe Pro Ser Asn Gly Pro Val Met Gln Lys Ala Ile
130 135 140

Leu Gly Met Glu Pro Ser Phe Glu Val Val Tyr Met Asn Ser Gly Val
145 150 155 160

Leu Val Gly Glu Val Asp Leu Val Tyr Lys Leu Glu Ser Gly Asn Tyr
165 170 175

```
Tyr Ser Cys His Met Lys Thr Phe Tyr Arg Ser Lys Gly Gly Val Lys
                180                 185                 190

Glu Phe Pro Glu Tyr His Phe Ile His His Arg Leu Glu Lys Thr Tyr
        195                 200                 205

Val Glu Glu Gly Ser Phe Val Glu Gln His Glu Thr Ala Ile Ala Gln
    210                 215                 220

Leu Thr Thr Ile Gly Lys Pro Leu Gly Ser Leu His Glu Trp
225                 230                 235
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